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The Concept of Oppositions as a Determining Factor for Development of Dialectical Mental Actions in the Thinking of a Pre-school Child

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Abstract

This research is dedicated to answering the question on how the content of oppositions and implementation of dialectical thinking operations are connected at pre-school and adult age. We say that segregation of oppositions is a basic component of the structure of dialectical thinking, the one that is extremely important at the pre-school age. This ability appears to be essential for the formation and implementation of dialectical actions. With that, once formed and rigidly fixed, for example, through some specifics of the educational environment, representation of oppositions might result in development of formal logical constructions.

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1. Introduction

Structural dialectical approach that has been developed since the beginning of 90th years of the XX century by Nikolay E. Veraksa [1;2;3], Alexandr N. Veraksa [4], Anastasia K. Belolutsкая [5], Larisa F. Bayanova [6], Evgeniy E. Krashennikov [1], Elena V. Rachkova [1], Igor B. Shiyan [7], Olga A. Shiyan [1] and others, is a new dawn for Russian psychological research field. This theory meaningfully considers such concepts as formal and dialectical logic, formal logical and dialectical thinking. Dialectical thinking is seen as creative and

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productive in the context of this approach. Following it, implementation of dialectical thinking means figuring out a pair of significant oppositions in a problematic situation, and therefore, finding some mediacy for the opposition. This leads to discovery, to a creative solution.

This study was meant to answer the question if really the fact that the concept of oppositions is not completely formed at the pre-school age makes children provide more productive dialectical answers than adult respondents.

2. Theoretical framework.

Problem definition is based partially on certain conclusions by classical explorers of the phenomena of thinking such as J. Piaget and Lev S. Vygotsky, and on the other hand, on the results of recent studies in the framework of structural dialectical approach. For example, In his “Principle features of child’s logic” J. Piaget describes insensitiveness of child’s thinking to an opposition: “judgments of a 7-8 year old child often entail one another without recognition of their inner connection. They just come one by one, never providing grounds to each other. Naturally, therefore opposite judgments just flock up as if they were condensating. They could appear as opposite for the child only if he or she could acknowledge implied definitions and the chain of his or her discourse” [8]. Here we can see that the thinker rejects any existence of logical experience in the mind of a junior or senior pre-school child. This very experience, according to Piaget, appears only at the age of 11-12 years along with the reflection of his/her own thinking processes. Lev S. Vygotsky, describing the stages of formation of conception thinking in his “Thinking and speech” [9], points out that pre-school children have so called complex thinking, which even though seemingly is close to conception one, has nothing to do with it structurally. The main difference is that the basis for aggregating some attributes in one complex is not an abstract logical, but concrete and real connection between separate elements, discovered when experienced directly. Therefore, one could conclude that such a deep structural relation of elements as an opposition cannot be differentiated or recognized by a child.

Structural dialectical theory also actively speculates on specific features of child’s perception of oppositions. Evgeniy V. Krashennnikov said in “Dialectical psychology” [10]: “...The following assumption is possible: there are 3 forms of relation to oppositions – there is dialectical thinking, where there is no controversy, but oppositions; formal logics which sees both oppositions and controversy; there is this specific child’s way, when there is no controversy neither oppositions but perception of everything as equal [11]. Moreover, Nikolay E. Veraksa’s conclusions made after studying pre-school thinking, claim dialectical thinking as integrated into the mechanism of child creativity. Thus, implementation of some operations of dialectical thinking leads to creation of new content. This does not allow stating that children have no logical experience at all, as they do demonstrate presence of dialectical structures, neither that the connections used by children are of personal subjective type only [11]. Earlier in our article “Dialectical structures of thinking of pre-school children and adults” [12] we mention that “often this is the ability to distinguish a controversy that appears as an attribute of maturity of the concept of opposition and, according to the majority of psychological theories, development of thinking. For many adults this very thing becomes an obstacle while implementing dialectical operations which can result in productive answer. In this case, the strategy of dialectical thinking becomes significantly more “costly” in an intellectual sense, than formal logical and symbolical way” [12].

3. Research Hypothesis

There is a significant positive interconnection between formed concept of oppositions and such a dialectical mental action as “dialectical mediacy”.

4. Research design

4.1. Participants

Experimental part of this study was conducted in 2 Moscow kindergartens (#1602, the one implementing “Dialectics” educational program and #1511, using a program named “Development”), 2 Moscow secondary schools (#1716 “Evrika-Ogonyok”, realizing elements of “Dialectics” program and #689), 2 universities (evening course of the faculty of education and psychology, Moscow state university of education and evening course of the faculty of social psychology, Moscow city university of education and psychology). 4 age groups took part in the research: pre-school children, junior school students, senior school students, adults, 232 respondents in total.

4.2. Methodological toolbox

“What cannot be simultaneously” technique in 2 parts.

4.3. Diagnostic procedure

We interviewed pre-school children and junior school students orally. Adults filled in a questionnaire in writing.

This tool consists of 2 parts. This is the instruction for the first one:

“Those are 5 lines with attributes. Think and underline 2 words in every row that cannot describe the same object, situation or person simultaneously, at the same time.

Those adjectives are the following as the form provides:

1. Black, small, warm, soft, white
2. Small, alive, yellow, hard, dead
3. Cold, white, dead, hot, big
4. Small, blue, hard, heavy, light
5. Big, green, cold, small, light

First part of the tool is designed so that to diagnose if the respondent has a concept of oppositions in general. Could he/she structure a simple row of attributes or perceives them as equal? Of course, this does not allow evaluation of the level of development of theoretical concept of an opposition, but helps to reveal the existence or non-existence of this structure in the mind of a child.

Here follows the instruction for the second part of the technique: *“You can see a 5-sheet questionnaire. Each sheet contains a pair of adjectives. You can see a question in the top of each page and variants of answers below. If you do agree with any suggested answer, underline “yes”, if not, underline “no”. Please provide detailed explication of your choice”.*

Instruction is provided orally, if something remains unclear, first page is analyzed together. “For example, you can see a question “Can we call this black and white simultaneously:..?” – and then the options come. For instance, a zebra? If you think that yes, we can call it black and white simultaneously, underline “yes” and substantiate your opinion. If not, underline “no” and also explain your view. The rest of the tasks have the same principle.

The question on the first page is “Can we call this black and white simultaneously:..?”

- A zebra
- bread
- a tooth (normally white but once sore, gets black)
- envy

- grey color

The following tasks are constructed in the same way but with other pairs of oppositions: alive-dead, hot-cold, light-heavy, big-small.

4.4. Comments and interpretation criteria

We gave 1 point for every underlined pair of oppositions and put the sum to the table.

Second part of the technique is dedicated to exploration of various types of handling with oppositions. When designing this questionnaire, we included in it 5 strategies, based on the typology proposed by Igor B. Shiyan, as follows:

1. Formal mediacy: oppositions are present in the same object, are given naturally and connected mechanically. First answers on each page belong to this type.
2. Aggregation on the basis of generic concept. In this case there is only one concept but several objects and, therefore, the requirements of the instructions are not met. Those are second answers on every page.
3. Differentiation on the criteria of observer and time. We united these strategies in one type as structurally they are very close. This is the third kind of responses.
4. Metaphorical aggregation. In this case one opposition is applied to the object directly and another in a metaphorical sense. They do not interact, therefore instructions got violated again. This is the fourth type of answers.
5. Productive strategy, i.e. dialectical answers – an object is found uniting 2 opposite attributes simultaneously, in the same moment of time.

5. Research Findings.

We found significant correlation in pre-school groups only. Correlation index for the group from the kindergarten #1602 means high reliability of our results ($r = 0,629$). Pre-school group from the kindergarten #1511 demonstrated inverse correlation for the “dialectical mediacy” parameter, but with the “formal mediacy” the relation appeared to be positive: $r_{xy} = 0,598$. Both values indicate that results of the first and the second parts of the technique are significantly interconnected with the error probability less than 5%.

Correlation indexes in both groups are not significant.

Even though average values for the first part of technique are increasing (pre-school children from the kindergarten #1602 demonstrate success rate for task completion is 37%, 57% for the kindergarten #1511, for junior school students from the school #1716 – 70%, for senior school children from the school #689 – 73%, for adults – 86%), determining significance of the ability to distinguish oppositions for successful development and implementation of dialectical mental structures, decreases with time.

However those results provided by pre-school children, eloquently confirm that the ability to distinguish oppositions is essentially necessary for formation of dialectical mental structures. This in its turn, speaks for our assumption that this agent is a basic element of the structures of dialectical thinking and is especially crucial at pre-school age. But this negative correlation in the group from the kindergarten #1511 shows that this condition is not sufficient. A representation of controversy, rigidly fixed, can lead to mutual exclusion of oppositions (which happens in the group from the kindergarten #1511, where the rate of refuses to answer is the highest – 75%) and development of formal logical thinking.

6. Discussion

Logical suppositions confirming the statement that pre-school children demonstrate dialectical thinking not spontaneously but consistently, are in the following: 1) statistically it is unlikely that stable high productivity of creative thinking of pre-school children can be explained with an accident, that a child transforms attributes systemlessly 2) even if pre-school children majorly do not demonstrate higher performance, diagnostics of individual differences reveals steadiness of implementation of productive strategy by the same respondent while completing a sequence of similar tasks. This also makes one doubt that children transform the situation randomly. Thus we can see that the problem of child's sensibility for controversies and his/her ability to handle with oppositions, implementing a certain strategy, is polemical.

7. Conclusion

Our hypothesis was partially confirmed. Distinguishing oppositions is a basic component of the structure of dialectical thinking at the pre-school age. This ability is necessary for formation and implementation of dialectical actions. This condition is also determining at the pre-school age, but with the time its significance decreases – above mentioned agent is essential but not sufficient. Representation of oppositions, formed and rigidly fixed due to specifics of educational situation, could result in development of formal logical structures.

8. Application

Results of this study allow improvement of existing dialectical educational programs and creation of new ones taking in consideration specific features of dialectical structures development for productive thinking of respondents of different ages.

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